REMARKS/ARGUMENTS

On pages 2 and 3 of the office action, the Examiner indicated that the term "service" used in the claims is a broad limitation which may include any network element, module, or feature. The Examiner suggested that the claims be amended to reflect what Applicant intends to claim.

The term "service" as used in the present application refers to a connection (a lightpath) identified by an originating node, a destination node, and a wavelength channel. A wavelength channel may be identified according to a wavelength band occupied by the channel. Numerous spatially segregated wavelength channels may occupy a given wavelength band, and the present application, therefore, identifies a wavelength channel by a unique dither tone or a unique combination of dither tones (well known in the art).

In response to the Examiner's suggestion, applicant amended the claims to limit the scope of the term "service" to specifically mean an end-to-end channel (a lightpath) from an originating network entity to a destination network entity which is uniquely identified by a respective dither tone. Corresponding support in the specification is found in paragraphs [0038] and [0040] of publication 2004/0073663 of the present application (*emphasis added*):

[0038] The uni-directional links can be ordered by the order in which the <u>optical light flows</u>, from the <u>beginning of the optical flow</u>, where the optical flow originated, to the <u>end of the optical flow</u>, where the optical flow terminates. For example, N uni-directional optical links can be ordered as L_1, L_2, L_3, . . . L_N, where the ingress of L_1 is the originating source of the optical flow, and the egress of L_N is the termination of the optical flow. Typically, but not necessarily, the optical links are located on different nodes.

[0040] In addition, for WDM networks, there are several wavelengths that flow through the same optical fiber. Each wavelength is an independent optical signal, or <u>channel</u>, capable of carrying traffic. In each instance, an optical channel in the network is <u>uniquely identified by a channel identifier</u>, or channel "id". The channel "id" is a combination of one or more relatively low frequencies (e.g. about 1 MHz or less), hereby known <u>as dither tones</u>, and is modulated

onto the channel. The combination of dither tones for a channel may be selected using any coding scheme, such that each combination of dither tones is unique in the network, and therefore each channel "id" uniquely identifies the channel instance in the network.

On page 3 of the office action, the Examiner states that the limitation "arranging" is broad. Applicant submits that while the term "arranging", taken in isolation, is broad, the limitation "arranging …. according to a sequence …." describes ordering alarms according to a specific sequence. To improve clarity, applicant replaced the term "arranging" with the term "ordering".

Corresponding support in the specification is found in paragraph4 [0044] of publication 2004/0073663 of the present application.

Claim Rejections – 35 U.S.C. § 102

Claims 1-13 are rejected under 35 U.S.C. § 102(e) as being anticipated by Valadarsky (U.S. Patent Publication 2002/0111755).

As discussed above, the term "service" used in the present application refers to an end-to-end lightpath identified by an originating network entity a destination network entity, and at least one dither tone. As such, the present application discloses a path-based problem identification and correction in a network. Valadarsky discloses a topology-based system for topologically analyzing alarms in a network.

Applicant notes that a network typically provides a large number of source-destination connections (lightpaths) each using a number of network entities. Failure of a network entity may affect numerous connections. A system devised for topology-based problem identification determines root causes of problems based on topological relationships among network entities. A system devised for problem identification of end-to-end connections relates alarms to a specific end-to-end connection and is of interest to a service provider.

Before discussing the individual claims, it is useful to compare the present application and the Valadarsky reference.

The need for path-based problem identification is explained in paragraph [0003] 2004/0073663 of the present application (*emphasis added*):

[0003] As the complexity of telecommunications networks continues to grow, the level of required reliability and availability of the networks continues to rise correspondingly. These factors place an increasing burden on diagnostic systems that are used to isolate and correct network problems. **For network service providers**, quick and accurate problem diagnosis and correction is critically important.

An exemplary "service" is described in paragraph [0005]:

 [0005] A common objective of the optical network is to carry traffic in the form of optically encoded binary data. A service, in this context, can be defined as the ability to carry this traffic from one point to another in the optical network. The optical network generally supports more than one service.

A "service-based" method for describing a problem in a network is outlined in paragraphs [0043] and [0044] of publication 2004/0073663 of the present application. A step of generating an ordered list of alarms along a path of a service is stated in paragraph [0045].A service-based corrective procedure is stated in paragraph [0054].

Definition of the term "service" in the Valadarsky reference

The term "service" in Valadarsky refers to a **function** or a **component** of a Topology-based Reasoning System (TRS), as described in paragraph [0261], and subsequent paragraphs recited below:

[0261] The **service** preferably includes the following main **building blocks**:

(Applicant notes that a building block is part of a software system, and a "service", as used in the Valadarsky reference, comprises a number of building blocks. A service in the present application is a connection identified by an originating network entity, a destination network entity, and other attributes such as a wavelength channel identifier –such as a modulating dither tone.)

[0262] A. **Correlation Engine**--This part of the CorrelateService preferably deal with the following actions:

[0271] Recovery--Read the alarm repository after the CorrelateService has been initialized (for example, after a "crash").

[0277] The CorrelateService preferably gets alarm information (new alarms, updates of alarms and drop of alarms) from the N_netcorre_handler, and processes them.

[0279] 1) The Service receives a new alarm, update of alarm data or drop of an alarm.

(Applicant notes that a Service in Valadarsky comprises software components capable of receiving and processing alarms. A service in the present application is a connection along a path as described above.)

[0282] 4) The decision algorithm computes the correlation on a group. Before terminating, it activates an action in the CorrelateService. The decision algorithm preferably works on several separate threads according to a pre-setup of the system.

[0283] 5) The CorrelateService calls a method for the creation of a derived alarm (if needed), and sends the parent/child data of the group to the N_netcorre handler, that is "subscribed" to the data.

[0295] Recovery after the CorrelateService was re-run.

[0385] The CorrelateService preferably create an alarm, with the following field values.

Discussion of Claims

In reference to claim 1, the Examiner asserts that Valadarsky teaches the limitation:

"selecting a subset of alarms associated with a service, said service having a unique identifier and being carried by a path in the network, the subset of alarms being selected from a list of alarms in the network". The Examiner refers to paragraphs [0145] and [0355] in Valadarsky.

Applicant submits that neither of the referenced two paragraphs discloses a step of

associating an alarm with a service, where a service is identified by an originating network entity, a destination network entity, and a dither tone, as recited in amended claim 1.

The Examiner further asserts that Valadarsky teaches the limitation:

"grouping alarms in the subset of alarms associated with said service in a number of groups of alarms, each group of alarms being associated with said service and with a network entity". The Examiner refers to paragraphs [0134] and [0335] in Valadarsky.

Applicant submits that paragraph [0134] refers to a process of topological correlation. Valadarsky defines the term "correlation" in paragraph [0096]:

[0096] Correlation--Involves interpreting state changes, which occur in networks, network elements, and operational equipment or systems, in the light of related conditions and circumstances.

Paragraph [0335] describes a process of grouping based on network topology and relying on a graph. A group in Valadarsky contains alarms that have a common root cause while a group in the present application comprises alarms associated with a connection identified by an originating network entity, a destination network entity, and at least one dither tone.

On page 6 of the office action, the Examiner further states that Valadarsky discloses the step of:

"arranging the groups of alarms according to a sequence in which they appear in a traversal of the path of the service in the network".

The Examiner refers to paragraphs [0366]-[0369] in Valadarsky.

Applicant submits that paragraphs [0366] to [0369] describe a process of the topology-based reasoning system (TRS) which uses a graph to identify related network elements and find a relevant rule. A "rule" is defined in paragraph [0110] in Valadarsky:

"[0110] Rule--Description of the behavior of alarms when particular type of fault occurs".

There is no mention *anywhere* in Valadarsky of a process of arranging alarms according to a sequence in which they appear along a path from an originating network entity to a destination network entity.

The Examiner further states that Valadarsky discloses the step of:

"transforming each alarm in each group of alarms into a problem description for the service". The Examiner refers to paragraphs [0160]-[0162] and [0382-384] in Valadarsky.

Applicant submits that none of the above referenced paragraphs discloses a step of providing a problem description for a service defined by an originating network entity, a destination network entity, and at least one dither tone. Valadarsky is silent regarding associating alarms with a path from an originating network entity to a destination network entity as claimed in the present application.

Thus, Valadarsky does not disclose the limitations of Claim 1. Accordingly, it is respectfully requested that the rejection of claim 1 be withdrawn.

In reference to claim 2, the Examiner states that Valadarsky teaches a method of claim 1 further comprising the step of providing a corrective procedure. The Examiner refers to paragraph [0105].

Applicant submits that the purpose of finding a root-cause of a problem is to facilitate a solution.   Paragraph [0105] in Valadarsky defines the term "root-cause" as a cause which is sufficiently detailed to enable repair.

Valadarsky determines a root-cause which enables repair in a topology-based reasoning system (TRS) while Claim 2 of the present application adds a step of providing a corrective procedure for a specific service defined by an originating network entity, a destination network entity, and a respective dither tone, according to the method of claim 1.

In reference to claim 3, the Examiner states that Valadarsky teaches the method of claim 1 wherein said grouping further associates each group of alarms with a type of said network entity. The Examiner refers to paragraph [0355].

Applicant notes that Claim 3 of the present application refers to selected network entities carrying a specific service, i.e., serving traffic from an originating network entity to a destination network entity while Valadarsky identifies a network component (Cable 1 – paragraph [0355]) resulting in alarms without associating the network component with a path carrying a specific connection.

Accordingly, it is respectfully requested that the rejection of claim 3 be withdrawn.

Claim 4 has been cancelled.

In reference to claim 5, the Examiner states that Valadarsky teaches the method of claim 1 wherein the step of grouping comprises associating at least one alarm with at least two network entities. The Examiner refers to paragraphs [0134] and [0335] in Valadarsky:

Applicant notes that claim 5 associates an alarm with more than one network entity. Paragraphs [0134] and [0335] relate alarms to network topology but do not disclose or contemplate a step of associating an alarm with two or more network entities.

Accordingly, it is respectfully requested that the rejection of claim 5 be withdrawn.

In reference to claim 6, the Examiner states that Valadarsky teaches a method for describing a problem in a network comprising a number of network entities, the method comprising limitations of claim 6.

The first four limitations of claim 6 have been discussed above in reference to claim 1 and clearly distinguished from the referenced prior art.

The Examiner further asserts that Valadarsky discloses the limitation:

"wherein the step of transforming each alarm further comprises the step of forming at least one template including text substitution markers". The Examiner refers to paragraphs [0383] to [0406] in Valadarsky.

Applicant notes the above limitation applies to the step of transforming each alarm into a problem description <u>for a service,</u> defined by an originating network entity, a destination network entity, and a dither tone, and adds a further step of <u>forming templates,</u> where a template includes <u>text substitution markers.</u> Templates with markers are illustrated in FIG.3a–FIG.3d and FIG. 8 of the present application. The templates are clearly devised for problem description associated with a path. Please see reference numerals 42, 48, and 54 (FIG. 3a and FIG. 3b), and paragraph [0047] of the present application:

Paragraphs [0383] to [0406] in Valadarsky describe a "derived alarm", defined in the Glossary section, paragraph [0106] as an "alarm created by management system based on received data that <u>better describes root-cause</u> than any alarm received from network (such as a cut wire)".

The "derived alarm" described paragraphs [0383] to [0406] is not associated with a respective service limited by a path from an originating network entity to a destination network entity.

Accordingly, Valadarsky does not disclose the limitations of claim 6 and it is respectfully requested that the rejection of claim 6 be withdrawn.

In reference to claim 7, the Examiner states that Valadarsky teaches the method of claim 6 wherein the text substitution markers correspond to network entities. The Examiner refers to paragraphs [0383] to [0406].

The text substitution markers of claim 7 relate to problem description for a service defined by an originating network entity, a destination network entity, and a dither tone. As discussed above, Valadarsky is silent regarding associating alarms with respective paths.

Accordingly, it is respectfully requested that the rejection of claim 7 be withdrawn.

In reference to claim 8, the Examiner states that Valadarsky teaches the method of claim 6 wherein the path is a two way path and the step of arranging the groups of alarms comprises arranging the groups of alarms in the direction of the path from the beginning of the

path to the end of the path. The Examiner refers to paragraphs [0366] to [0369].

Applicant submits that the referenced paragraphs describe a forward traverse and a backward traverse of a graph representing a network in order to find a root cause of a problem. There is no mention anywhere in Valadarsky of relating an alarm to a path from an originating network entity to a destination network entity.

Accordingly, for the reason that Valadarsky does not disclose the limitation of "arranging the groups of alarms in a direction of the path from a beginning of the path to an end of the path", it is respectfully requested that the rejection of claim 8 be withdrawn.

In reference to claim 9, the Examiner states that Valadarsky teaches the method of claim 6 wherein the path is a two way path and the step of arranging the groups of alarms comprises arranging the groups of alarms in a direction of the path from an end of the path to the beginning of the path. The Examiner refers to paragraphs [0366] to [0369].

As described in reference to claim 8, the referenced paragraphs describe using a graph to find a root cause of a problem. Valadarsky does not disclose relating an alarm to a service having a unique identifier and being carried by a path in the network as stated in claim 6 on which claim 9 directly depends

Accordingly, it is respectfully requested that the rejection of claim 9 be withdrawn.

In reference to claim 10, the Examiner states that Valadarsky teaches the first four limitations of claim 10.

The first four limitations of claim 10 have been clearly distinguished from the referenced prior art in the discussion of claim 1.

The Examiner further asserts that Valadarsky discloses the limitation:

"wherein the type of problem comprises one or more of: a missing channel identification alarm; an unexpected channel identification alarm; a loss of signal alarm; and a channel power out of range alarm". The Examiner refers to paragraph [0384] in Valadarsky:

Applicant submits that paragraph [0384] describes a "derived alarm" which is defined in paragraph [0106] in Valadarsky:

[0106] Derived alarm--Alarm <u>created by management system</u> based on received data that better describes root-cause than any alarm received from network (such as a cut wire).

Applicant further submits that none of the following four types is mentioned *anywhere* in Valadarsky:

a missing channel identification alarm;

an unexpected channel identification alarm;

a loss of signal alarm; and

a channel power out of range alarm.

Thus, Valadarsky does not disclose the limitations of claim 10. Accordingly, it is respectfully requested that the rejection of claim 10 be withdrawn.

In reference to claim 11, the Examiner states that Valadarsky teaches the method of claim 1 wherein the description is a verbal description.

In reference to claim 12, the Examiner states that Valadarsky teaches the method of claim 11 wherein the description is a text description.

In reference to claim 13, the Examiner states that Valadarsky teaches the method of claim 1 wherein the description is a pictorial description.

In rejecting claims 11, 12, and 13, the Examiner refers to paragraphs [0484] to [0492]. Paragraphs [0484] to [0492] are recited below for ease of reference:

[0484] In order to ease the rules definition, the defined rules may concentrate on two entities related to one another, by a relationship. For example:
[0485] 1. "contains"
[0486] 2. "connected"

[0487] 3. "terminated by"

[0488] 4. "In route"

[0489] 5. "pass through"

[0490] 6. "used by"

[0491] The following table illustrates an example of a set of rules that can be defined:

5 Object Fault Object Fault Type 1 Type 1 Type 2 Type 2 Relation Network Fault Card Fault Contains element Card Fault Port Fault Contains Port Fault 1 Fiber Fault Connected Cable Fault Fiber Fault Contains Port Fault Port Fault 2 Connected

[0492] A rule is defined as a pair of object type and object ID connected by a relation.

Applicant submits that Valadarsky is silent regarding the form of presenting a description. The referenced paragraphs define six relationships for a pair of entities to be used in rule definition.

Applicant notes, however, that the use of vocal, text, or pictorial presentation is a common practice. Claims 11, 12, and 13 depend on claim 1 which comprises steps each of which distinguishes the claimed method from the method of Valadarsky. Claims 11, 12, and 13 add useful features to the method of claim 1.

Accordingly, it is respectfully requested that the rejection of claims 11, 12, and 13 be withdrawn.

CONCLUSION

Claims 1-3 and 5-13 are pending. The claims have been clearly distinguished from the cited prior art. The term "service" has been explicitly defined in the claims rather than relying on the meaning given in the specification.

No new material has been added to the claims.

Favorable consideration and allowance are earnestly solicited.

Respectfully submitted,

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